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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/628,397 | 08/01/2000 | Yee S Ng | 81345JDL | 5650 |

7590 03/28/2005

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| EXAMINER | |
|---|---|
| LEE, TOMMY D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2624 | |

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/628,397 | NG ET AL. | |
| | Examiner | Art Unit | |
| | Thomas D. Lee | 2624 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-5 and 7-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *4 and 9* is/are allowed.

6)☒ Claim(s) *1-3,5,7 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. This Office action is responsive to applicant's amendment filed October 26, 2004. Claims 1-5 and 7-9 are pending.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not appear to disclose a step of rasterizing image data and providing continuous tone color separation data, *following* the step of processing image data using undercolor removal and/or gray component replacement. A raster image processor 422 (see Fig. 19) is mentioned on page 23, lines 4-7, of applicant's specification, as receiving input from an electronic data source 420. The specification does not set forth any undercolor removal and/or gray component replacement processing between reception from the data source and processing by the raster image processor. Furthermore, applicant's specification discloses undercolor removal and/or gray component replacement by means of color transformation operation 416 for processing image data from a document scanned by

scanner 410 (page 21, lines 3-12). The color separated (R,G,B) continuous tone (8-bit) image data is inherently rasterized *prior to* undercolor removal and/or gray component replacement processing by the color transformation operation, as the data must be rasterized so as to be stored as a bitmap in buffer 412. Moreover, although image data from the color transformation operation is shown in applicant's Fig. 19 as being transmitted to the raster image processor, the specification does *not* disclose that any image data output from the color transformation operation is actually rasterized in the raster image processor. Therefore, a step of rasterizing image data and providing continuous tone color separation data, *following* the step of processing image data using undercolor removal and/or gray component replacement, is not disclosed.

***Claim Rejections - 35 USC § 102***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,974,171 (Hayashi et al.).

Hayashi et al. disclose an edge enhancement method for processing image data comprising: processing image data using under color removal and/or gray component replacement (noting Fig. 10, masking UCR 232); rasterizing the image data and providing continuous tone color separation image data (CCD line sensor outputs RGB data, inherently rasterized to form 8-bit digital data for processing (column 9, lines 2-6)); and adjusting edge enhancement processing of the image data in accordance with whether or not under color removal and/or gray level replacement is used or the extent

of such use (space filter 233 (column 9, lines 21-23)). The output of the masking UCR is directly connected to the space filter (Fig. 10), and thus edge enhancement processing is adjusted according to the extent of the use of the masking UCR, since the output value of the masking UCR directly determines the value of the input to be processed by the space filter.

***Claim Rejections - 35 USC § 103***

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-3, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,920,646 (Kamon) in view of U.S. Patent 5,703,971 (Asimopoulos et al.) and Hayashi et al.

Regarding claim 1, Kamon teaches an edge enhancement processing system for modifying image data at certain pixel locations to include gray scale image data so as to reduce jaggedness in the image, the system comprising: a threshold device that establishes a current binary pixel value for an incoming rasterized continuous tone gray level image pixel data in accordance with a thresholding criterion (gradation processing circuit 19 (column 9, lines 62-67; column 12, lines 42-54) for processing image data read by CCD image sensor 9 and converted to rasterized digital data having 256 levels of gradation per pixel (column 8, lines 47-52)); and an edge enhancement image processing device that examines the current binary pixel and neighboring binary pixels in accordance with predetermined criteria for determining adjustment of the current pixel to a gray scale value to reduce edge jaggedness of the image (pattern memory 106

(column 11, lines 32-50); jagged line correction utilizes multi-value data for smoothing jagged oblique lines (column 13, lines 47-50)).

Kamon does not teach an adjustable threshold device with an operator accessible input to the threshold device for adjusting a threshold value in the thresholding criterion. Asimopoulos et al. teach an edge enhancement processing system (column 6, lines 54-59) that provides this feature (threshold calculation module 3, where "t" is set by a user (column 3, lines 50-57)). This provides the advantage of allowing a user to adjust to different background levels, thereby optimizing contrast of images and background, and thus it would have been obvious for one of ordinary skill in the art to modify the teaching of Kamon by providing a threshold calculation module such as taught by Asimopoulos et al.

The combined teachings of Kamon and Asimopoulos et al. are not directed to color separation image data. Hayashi et al. teach an edge enhancement method (space filter 233 (Fig. 10) conducts edge enhancement or smoothing (column 9, lines 21-22)) which operates on color separation image data (CCD line sensor outputs RGB data (column 9, lines 2-3)). Since means for processing color image data are well known in the art and allow for the enhancement of edges found in color images as well as non-color images, thereby providing greater versatility, it would have been obvious for one of ordinary skill in the art to have modified the combined teachings of Kamon and Asimopoulos et al. by providing means for reading and transforming color images, such as taught by Hayashi et al.

Regarding claims 2, 3 and 5, Kamon teaches an edge enhancement method for processing image data comprising: establishing a current binary pixel for an incoming rasterized continuous tone gray level image pixel data in accordance with a thresholding criterion that employs a threshold value (gradation processing circuit 19 (column 9, lines 62-67; column 12, lines 42-54) for processing image data read by CCD image sensor 9 and converted to rasterized digital data having 256 levels of gradation per pixel (column 8, lines 47-52)); examining a current binary pixel and neighboring pixels thereto in accordance with predetermined criteria to determine an adjustment of the current binary pixel to a gray scale value to reduce edge jaggedness of the image (pattern memory 106 (column 11, lines 32-50)); and substituting the gray scale value for the current binary pixel to reduce edge jaggedness of the image (jagged line correction utilizes multi-value data for smoothing jagged oblique lines (column 13, lines 47-50)).

Kamon does not teach a step of determining an adjustable threshold value in a holding criterion in response to an input from an operator. As mentioned above, Asimopoulos et al. teach an edge enhancement processing system (column 6, lines 54-59) that provides this feature (threshold calculation module 3, where "t" is set by a user (column 3, lines 50-57)). This provides the advantage of allowing a user to adjust to different background levels, thereby optimizing contrast of images and background, and thus it would have been obvious for one of ordinary skill in the art to modify the teaching of Kamon by providing a threshold calculation module such as taught by Asimopoulos et al.

The combined teachings of Kamon and Asimopoulos et al. are not directed to color separation image data that has been subjected to undercolor removal and/or gray component replacement (claim 3) or a color transformation process (claim 5) before being transformed into a binary pixel. Hayashi et al. teach an edge enhancement method (space filter 233 (Fig. 10) conducts edge enhancement or smoothing (column 9, lines 21-22)) which operates on color separation image data (CCD line sensor outputs RGB data (column 9, lines 2-3)) that has been subjected to under color removal and/or gray component replacement (masking UCR circuit 232 conducts masking and UCR by a matrix operation (column 9, lines 19-21)) and a color transformation process (minimum value extraction circuit 231 extracts minimum value from logarithm-converted CMY data from LOG conversion circuit 230 (column 9, lines 15-19)) before being transformed into a binary pixel (binarization circuit 235 (column 9, lines 24-26)). As mentioned above, since means for processing color image data are well known in the art and allow for the enhancement of edges found in color images as well as non-color images, thereby providing greater versatility, it would have been obvious for one of ordinary skill in the art to have modified the combined teachings of Kamon and Asimopoulos et al. by providing means for reading and transforming color images, such as taught by Hayashi et al.

Regarding claim 7, Asimopoulos et al., as mentioned above regarding claims 1 and 2, teach an adjustable threshold value which is determined in accordance with a selection by the operator (threshold calculation module 3, where "t" is set by a user (column 3, lines 50-57)). While not taught by Kamon in view of Asimopoulos et al.,

Hayashi et al. teach color image processing that includes under color removal and/or gray component replacement (masking UCR circuit 232 conducts masking and UCR by a matrix operation (column 9, lines 19-21)), and since means for processing color image data are well known in the art and allow for the enhancement of edges found in color images as well as non-color images, thereby providing greater versatility, it would have been obvious for one of ordinary skill in the art to have modified the combined teachings of Kamon and Asimopoulos et al. by providing means for reading and transforming color images, such as taught by Hayashi et al.

***Allowable Subject Matter***

8. Claims 4 and 9 are allowed.

9. The following is a statement of reasons for the indication of allowable subject matter: No prior art has been found to teach or suggest "providing operator adjustable modification of the strength of the gray scale value substituted for the rasterized continuous tone color separation gray level image data," as recited in claim 4, or "wherein the adjustment includes adjustment of a threshold value used for comparing image data processed by under color removal and/or gray component replacement" as recited in claim 9.

***Response to Arguments***

10. Applicant's arguments filed in response to the prior rejection of the claims, as set forth on page 5 of the amendment filed October 26, 2004, have been fully considered but they are not persuasive. With regard to each of the rejections, applicant asserts that none of the reference, either singularly or in combination, disclose or suggest an

adjustable threshold device that establishes a current binary pixel value for an incoming rasterized color separated continuous tone gray level image pixel data or establishing a current binary pixel value for incoming rasterized continuous tone color separation gray level pixel data in accordance with threshold criterion (claims 1 and 2); or establishing a current binary pixel value for incoming rasterized continuous tone color separation gray level pixel data in accordance with thresholding criterion (claims 2, 3 and 7 (note: The prior Office action dated July 26, 2004, at page 5, line 6 – page 6, line 3 clearly indicates examiner's intention that claim 5, not claim 2, was to have been rejected in view of Kamon, Asimopoulos et al. and Hayashi et al.)); or adjusting edge enhancement processing of rasterized continuous tone color separation image data (claim 8). These arguments are based on the claims as amended in response to the prior Office action. The added limitation (processing of rasterized continuous tone color separated image data) is disclosed in the references, as set forth above in the rejection of the claims.

***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

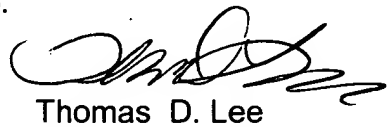
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas D. Lee whose telephone number is (703) 305-4870. The examiner can normally be reached on Monday-Friday (7:30-5:00), alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (703) 308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thomas D. Lee
Primary Examiner
Art Unit 2624

tdl
March 24, 2005